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September 6, 1958

VOL. 74 NO. 10 PAGES 145-160

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

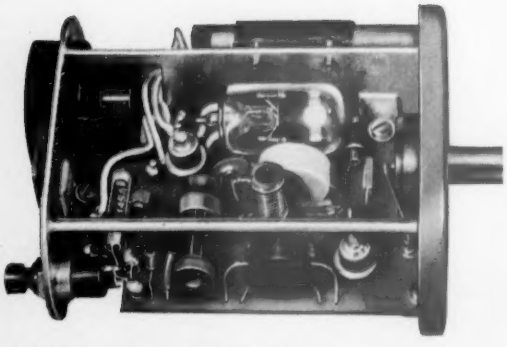
Mother Penguin

See page 148

A SCIENCE SERVICE PUBLICATION

Bell Laboratories Announces Pocket-Sized Frequency Standard for Microwave Systems

Lawrence Koerner, who developed the portable frequency standard, demonstrates how the device can be plugged in at a radio relay station to supply a checking frequency. Battery-powered, the device maintains precision calibration for several months.



Inside the portable frequency standard. Four Laboratories-developed devices make it possible: (1) transistor, which converts the power from a battery to radio frequency oscillations; (2) voltage reference diode, which maintains constant voltage; (3) piezoelectric crystal unit of superlative stability; (4) thermistor, which corrects for temperature variations.

Microwave radio relay systems depend critically on the accuracy of their "carrier" frequencies. At scores of relay stations along a route, carrier frequency oscillators must be checked periodically against a signal from a precise standard.

In the past, the maintenance man has had to obtain his checking frequency by picking up a standard radio signal from a government station. This operation takes time—and requires elaborate equipment.

With a new *portable* frequency standard developed by Bell Laboratories engineers, the job is much simplified. To check an oscillator, the portable standard is plugged in, and a button is pressed. In seconds, it supplies a checking frequency accurate to one part in a million.

Until now, such precision in a frequency standard has been obtainable only in a laboratory. The new portable standard makes it available for routine use in the Bell System. First use of the standard will be to maintain frequency control in a new microwave system for telephone and TV, now under development at Bell Laboratories.

BELL TELEPHONE LABORATORIES

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ASTRONAUTICS

Plan Space Telescope

The Congress of the International Astronautical Federation in Amsterdam was told of plans to put a telescope on an earth satellite and to reduce interplanetary travel time.

➤ ASTRONOMERS wish to put a telescope on an earth satellite in order to observe the stars from outside the masking of the earth's atmosphere, and the Congress of the International Astronautical Federation in Amsterdam was told that it can be done.

Dr. Fred L. Whipple, director of the Smithsonian Astrophysical Observatory and Harvard University astronomy professor, said the telescope would focus radiation from celestial objects so that an electronic scanning device can provide an image of an area of the sky at a monitoring station on the ground. The space telescope would be be operated by remote control and there would be power in the satellite to keep it from rotating and spoiling the view and focus.

A wealth of new material would be obtained by the orbiting telescope in the far ultraviolet regions of the spectrum and this, Dr. Whipple said, would increase our understanding of the universe.

Such a telescope could be launched in a relatively short time if facilities are made available, because no major technological developments are required. It could be constructed, launched, and operated by reasonably simple modifications of present instrumentation.

For rocket propulsion, designers are turning to exploring the use of free radicals or dissociated molecules as high energy propellants, Dr. G. C. Szego of the General Electric Company's flight propulsion laboratory at Cincinnati, Ohio, told the Congress.

Conventional chemical propellant systems are not able to yield an effective operating impulse of more than 400 "seconds," he explained.

A special branch of mathematics, the calculus of variations, although discovered 200 years ago, has found today "a most powerful application in the study of the flight paths of rockets and missiles," Dr. Angelo Miele of Purdue University's school of aeronautical engineering, told the Congress.

Devices for telling space travelers and watchers from earth the location of satellites and space rockets in relation to the earth were described by Edward J. Madden of the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. The information needed should be a translation of machine language and should be presented simply as a picture of the earth over which the object moves, he said.

A nuclear energy powered rocket that can achieve exhaust velocities ten times as speedy as any chemical rocket was visualized by Dr. F. Winterberg of Hamburg, Germany, in a paper before the Congress. Hydrogen would be heated in a nuclear reactor up to several thousand degrees and then expanded in a nozzle. Higher exhaust velocities would be obtained by heating the hydrogen during its initial expansion.

MODERN HOME—The Unesco House that, from the standpoint of design, construction and purpose, is the most international building in Paris, will be officially opened to the public on Nov. 3, 1958.

Interplanetary Time Cut

➤ TRAVEL TIME from earth to Mars or Venus and back can be reduced a year or more by starting out with velocities slightly higher than the lowest needed to make the trip.

Dr. W. E. Moeckel of the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics, has reported that the round-trip time to Venus can be cut 360 days by increasing the initial velocity one and a half miles per second.

Round-trip time to Mars, Dr. Moeckel told the Congress, can be reduced from 973 days to 400 days by starting out at about 15 miles per second instead of about seven miles per second.

A large part of interplanetary travel time, he pointed out, would be spent at the destination planet waiting for the earth and the planet to move into the proper relative position so that the returning spaceship and earth will arrive at the same point at about the same time. Because of this problem, simple reductions in transit time do not necessarily produce reductions in total round-trip time.

Dr. Moeckel tackled the problem of reducing the total trip time as much as possible and at the same time using the least possible excess energy and, therefore, fuel.

To have a common basis for comparing the paths, Dr. Moeckel considered trips starting from a circular orbit around earth and ending in a circular orbit around the planet. The reduced times apply only if the space ship spends a very short time at the destination planet.

Sizable increases in starting velocity are required to provide adequate exploration time, Dr. Moeckel concluded.

Probe Corona Mysteries

➤ A BOLD PLAN to investigate the sun with a special rocket in order to solve some of the solar mysteries was discussed by Dr. R. P. Haviland of General Electric's missile and ordnance systems department, Philadelphia, at the Congress.

With the present state of the rocket art the distance of closest approach to the sun would be the orbit of the planet Mercury. But with available components scientists could make a solar probe vehicle that would reach within 5,000,000 miles of the solar surface.

"The earth is immersed in the solar atmosphere," Dr. Haviland explained. In the vicinity of the earth this atmosphere consists largely of ionized hydrogen with a density of about 400 particles per cubic centimeter. During an eclipse the excited atmosphere of the sun may be observed as the corona, which extends to a distance of 24 radii from the sun with a temperature of about 1,500,000 degrees Kelvin.

Parts of a solar probe already available would withstand temperatures that would allow a relatively close approach to the sun.

Dr. Haviland suggested a solar probe should be attempted during the extension of the International Geophysical Year.

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MEDICINE

School Children Suffer Neglected Foot Ailments

➤ MOST CHILDREN who will return to school this fall will have seriously neglected but correctable foot ailments.

A nationwide survey, conducted by the American Foot Health Foundation, revealed that 78% of school-age children have foot ailments. These figures are based upon a pilot study of 100,000 children.

A program for regular foot examinations in the schools has been proposed by the foundation, Dr. Sidney Hirschberg, president, reported at the 46th annual meeting of the American Podiatry Association in Washington.

In view of the need for examinations of school children, the foundation outlined a nationwide program for conducting children's free foot health examinations in October, 1958, by licensed foot doctors in support of the activities of President Eisenhower's Council on Youth Fitness. Cooperation of local boards of education and podiatry societies will be called upon to execute such a program.

Science News Letter, September 6, 1958

BIOLOGY

Adelie Baby Is Well Protected Against Cold

See Front Cover

➤ THE WATCHFUL Adelie penguin mother shown on the cover of this week's SCIENCE NEWS LETTER has chosen a rocky nest for her young one. This newly hatched chick proudly poses among the estimated 10,000 birds at the Penguin Rookery located on Mt. Bird, Ross Island, McMurdo Sound, Antarctica.

The Adelie penguins were first seen by the French explorer, Admiral d'Urville, who named them after his wife. The Adelie is about two and a half feet high and, compared with the dignified Emperor penguin, these birds are more fun-loving.

These cold weather birds lay only one egg each year and may travel as far as 400 miles over snow and ice and through the water to reach their nesting grounds. The female uses small stones and the bones of penguins that have died on the rookery in past years to build her nest.

Science News Letter, September 6, 1958

ASTRONAUTICS

Weightlessness in Space Increases Re-Entry Effect

➤ WHEN A PILOT of a rocket vehicle re-enters the earth's atmosphere after having been weightless in space flight, he will have less tolerance to acceleration and less rapid recovery from space effects than in ordinary flight conditions of constant gravity, Dr. Harald J. von Beckh of the Aero Medical Field Laboratory of Holloman Air Force Base, N. Mex., told the Congress of the International Astronautical Federation in Amsterdam.

Using a F-49C jet fighter, human reactions to accelerations followed or preceded by weightlessness were tested by flying two patterns that combined a period of 40 seconds at 4 to 6.5 G's with a maximum of 45 seconds at subgravity, or weightless, conditions.

The human guinea pigs, pilots and non-pilots, reported grey-out, black-out and loss of consciousness at lesser thresholds than those who flew as controls.

Dr. von Beckh warned that in planning manned space flight the thrust and re-entry plans should take the lower acceleration tolerances into account and the pilot should have adequate G-protection to prevent danger from high accelerations.

Science News Letter, September 6, 1958

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ASTROPHYSICS

Stars Build Elements

➤ ALL KNOWN chemical elements are built in the hot interiors of stars by eight nuclear processes as conditions become ripe.

Thermonuclear reactions such as man is now trying to control in the laboratory are the basis of stellar synthesis of elements.

A tie-in between the relative amounts of the various elements and the properties of nuclei supports this theory of stellar formation of matter, Drs. Margaret and Geoffrey Burbidge of Yerkes Observatory, Williams Bay, Wis., report. In *Science* (Aug. 22), the husband-and-wife team outlines results of a broad-scale attack on the problem of element synthesis.

Although the sun is about five billion years old, it must be at least a third-generation star, they conclude. Otherwise, it would be difficult to account for the variations in the elements in the solar system.

Starting from the observed element distribution, the Drs. Burbidge suggest that matter was created in as simple a form as possible. This could be as pure hydrogen, the lightest and simplest chemical element, or as fundamental particles, protons, neutrons and electrons and, possibly, their antiparticles.

The rest of the elements have been produced subsequently by physical processes according to known laws. This would be so whether the universe started with a big bang or whether matter is being created continually.

When a star first condenses out of interstellar gas and dust, it goes through a period of gravitational contraction. Eventually, when its central temperature becomes sufficiently high, it begins to obtain its energy by converting hydrogen to helium in its core. This is the hydrogen bomb reaction man has duplicated on earth in the unleashed fury of nuclear explosions.

After a while, since there is no mixing between the core and outer layers, the star's composition is no longer uniform. Then its structure will change slightly so that it remains in equilibrium, and the star becomes slightly brighter.

By the time the helium core has grown to contain about 10% of its mass, the star must change its structure drastically to remain in equilibrium. At this point, its core contracts, releasing gravitational energy to supplement its energy output and heating up its interior, while the outer envelope expands greatly and cools.

In this way a star moves from the "main sequence" to become a red giant. Eventually the core becomes hot and dense enough for nuclei with charges greater than hydrogen to interact.

When the star has exhausted all of its nuclear fuel, which will take about a hundred billion years for the sun, it may either undergo a gigantic catastrophic explosion as a supernova, or settle down quietly in the form of collapsed matter as a white dwarf. It may also do both.

Besides the hydrogen- and helium-burning process, the Drs. Burbidge report, the other processes are neutron capture, which can occur both slowly and rapidly; catalytic processes; equilibrium process; capture of alpha particles, the nuclei of helium atoms; a modifying process when the nucleus emits a proton or gamma ray, and alpha decay or fission.

The element synthesis theory reported by the Drs. Burbidge is part of a long-range study being made cooperatively by several scientists, including Prof. Fred Hoyle of Harvard College Observatory; Dr. R. F. Christy of California Institute of Technology, Pasadena; Dr. Jesse L. Greenstein, Mt. Wilson and Palomar Observatories; Dr. Martin Schwarzschild, Princeton University; and Drs. Harold C. Urey and Hans E. Suess of Scripps Institution of Oceanography, La Jolla, Calif.

Science News Letter, September 6, 1958

GHOSTLY FIRE FIGHTER—The U. S. Army's aluminum fire fighting suit, now undergoing intensive action tests, is made of flame-retardant, treated aluminized kraft paper laminated with a flame-resistant adhesive to a reflective aluminum foil. The face mask has tiny holes to give visibility.

GENETICS

Soviet Scientists Revert To Lysenko's Genetics

➤ SOVIET SCIENTISTS at the International Genetics Congress in Montreal are maintaining their biological theory, opposed by most colleagues from the West, that the heredity of plants and animals can be permanently altered by such environmental effects as grafting in the case of plants and the injection of blood in the case of chickens.

The U.S.S.R. delegation is predominantly adhering to Michurinism as advocated by Lysenko, who under Stalin dominated Russian plant and animal breeding. This persistence and reversion to doctrine thought to be on the way out is surprising and disappointing to most geneticists.

Something seems to have happened in official Russian genetics just a few weeks ago and this has puzzled American leaders. The first list of Soviet delegates to the Congress contained the names of some well-respected scientists who had participated in previous international meetings. Abstracts of their papers were received and printed.

Then at the last minute Congress officials learned that virtually all these older geneticists who accepted Mendel and Darwin would not be in attendance. Instead other delegates were coming with different attitudes.

The papers that were presented included one by I. E. Gloushtshenko of Soviet Academy of Sciences, who reported that many years of experiments showed that, by grafting, hybrid forms can be obtained similar to those obtained by sexual hybridization. His colleague, N. V. Tsitsin, told of crossing widely different kinds of cereals to obtain new species of forage grain, perennial and winter wheats.

Another Moscow geneticist, H. F. Kushner, told how transfusion of blood from New Hampshires and gray semi-wild ducks into white leghorns resulted in the inheritance of pigmented feathering of some of the progeny in subsequent generations. (See SNL, May 10, p. 298.)

Attempts have been made in past years to have Russian scientists claiming such results come to the U. S. and repeat their experiments here but such invitations have not been accepted. Their Western colleagues will not believe their explanations until there are repeated supervised or independent duplications.

Science News Letter, September 6, 1958

BIOLOGY

Water Hyacinth Threatens to Clog Nile

➤ THE EXPLOSIVE growth of a purple-flowered plant is threatening Nile River travel in the Sudan, a scientist reports in *Nature* (Aug. 3).

The water hyacinth, which grows in free-floating mats along many stretches of the Nile, has been found in new spots for the first time. Already, Dr. Peter A. Gay of the University of Khartoum reports, the plant is a minor nuisance to steamboats by interfering with the water intake for engine cooling.

Sudanese and others familiar with the river cannot remember seeing the plant before last winter, thus pointing to the explosive nature of its growth.

Eichornia crassipes, the water hyacinth's scientific name, also grows along the river margins and as rooted but floating mats—masses of floating leaves, flowers and stems.

Local tropical storms probably are important in accounting for the wide distribution of the water hyacinth and other water plants help out by reducing the drag of the river current on the growing water hyacinth.

Science News Letter, September 6, 1958

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ORNITHOLOGY

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Accurate recordings of bird songs followed "by use of an ingenious machine known as a sound spectrograph" have recently given animal sounds a welcome degree of objectivity, Dr. Wesley E. Lanyon of the American Museum of Natural History, New York, said.

Studies of the songbirds, a higher group than ducks, water fowl, birds of prey and shore birds in the evolutionary scale, reveal that their simple call notes are remarkably stereotyped and genetically fixed, the ornithologist told the Ecological Society of America meeting in Bloomington, Ind.

Some songbirds reared from the egg in sound proof rooms developed original song motifs. These were only a little like the songs of their respective species.

Apparently birds refine and supplement these original songs by imitating other birds' songs. This is important in giving a bird song a distinct geographical dialect.

Concurring with Dr. Lanyon was Dr. Donald J. Borror, an Ohio State University zoologist. He told the Society there is a hereditary basis for certain features of sparrow songs, but many of the variations are learned from other birds.

He found through recordings that song sparrows from adjoining areas have many notes and phrases in common although differently arranged.

"At the end of 1957 our collection . . . contained 240 recordings of song sparrow songs," he said. "These 240 recordings are of 96 different birds. They contain 2,105 individual songs, representing 211 different song patterns."

Dr. Borror said many song details are not apparent to the human ear and songs of some birds contain more complex elements than hitherto supposed.

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PUBLIC HEALTH

Tomorrow's Hospital Goes Underground

➤ TOMORROW'S hospital is likely to go underground.

Right now Federal Government and medical observers are carefully studying a unique New Jersey hospital project designed with its "functioning nucleus" below street level. Operating rooms, intensive care units and emergency facilities are all located underground.

The new design will mean savings for many patients as well as more efficient use of the hospital staff, Dr. George C. Schicks, executive secretary of St. Barnabas Medical Center, near Newark, N. J., reports.

Designed as the "hospital of tomorrow for war and peace," the 650-bed medical center combines concepts of progressive hospital care with those of survival under catastrophe. Shelter areas will serve to protect patients and local residents from the effects of fallout in the event of a wartime or peacetime disaster.

It has separate wings for admission, convalescence, and patients requiring special or intensive care. Many patients can save as much as $50 a day in fees that ordinarily would have been paid to special nurses, Dr. Schicks points out in the *Journal of the American Medical Association* (Aug. 23).

The Medical Center, expected to serve some 250,000 persons in nearby communities, is set for completion in 1960. Use will be made of the hospital facilities and staff in order to set up a full-scale health education program. Public forums, live demonstrations, films and television will be used. The center will cost an estimated $12,000,000.

The aim of the center plan is, Dr. Shicks explains, "to reduce one's chances of being the one person in eight who will become a hospital patient this year."

Science News Letter, September 6, 1958

● RADIO

Saturday, Sept. 13, 1958, 1:30-1:45 p.m., EDT

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. E. D. Vinogradoff, executive director, The President's Committee on Scientists and Engineers, Washington, D. C., will discuss "The Coming Lean Generation."

BIOCHEMISTRY

Vitamin K Has Vital Role In Photosynthesis

➤ A FURTHER STEP in understanding the mystery of photosynthesis, the process by which green plants use light to make their food, has been taken.

Vitamin K, important in human diets since it is necessary to coagulate blood, apparently also plays a vital role in plant life. It seems to be a chemical catalyst present in chloroplasts, the green particles found in some plant cells. A catalyst helps a reaction take place without actually participating in it.

Norman I. Bishop, assistant professor of biochemistry at the University of Chicago's Institutes for Basic Research, has reported experiments in which he isolated chloroplasts from spinach leaves. He removed their moisture and fat-soluble chemicals and found that in solution the chloroplasts could no longer perform their complex photosynthetic reactions.

However, Mr. Bishop reported, when man-made forms of vitamin K were added to the solution one important reaction was restored. The chloroplasts were able to convert water and ferric iron to hydrogen, ferrous iron and free oxygen.

The biochemist believes vitamin K may act as a "neutral corner" for hydrogen atoms that have been separated from water. The hydrogen later combines with carbon dioxide to make carbohydrates, another step in photosynthesis. Without the vitamin, Mr. Bishop explained, the hydrogen would ultimately rejoin the oxygen and form water again.

Science News Letter, September 6, 1958

PHYSICS

Test Cheap H-Bomb Power

➤ THE "ASTRON," a device to test the production of power by taming the hydrogen bomb's fiery reactions, has been described for the first time.

Nicholas C. Christofilos, physicist at the University of California's Radiation Laboratory, Livermore, told the American Physical Society meeting in Vancouver that a model of the Astron is now being built. Designed ultimately to yield cheap energy from the controlled fusion of hydrogen nuclei, the concept is considered sufficiently promising that costs of operating a full-scale machine have been investigated.

Preliminary results of the economic study indicate operation of a power producing thermonuclear reactor based on the Astron idea might be economically competitive with conventional power sources.

Key to the Astron approach is a cylindrical sheet of high-energy electrons, the negatively charged bits of matter that carry electrical currents.

This electron sheet, called the E-layer, would be responsible, in principle, both for providing the magnetic confinement of the plasma and for heating it to thermonuclear temperatures, on the order of 100,000,000 degrees centigrade.

The Astron will be composed of a long vacuum cylinder through which a magnetic field will be established by means of external coils, the direction of the field being parallel to the axis of the cylinder. When electrons of several million electron volts are injected into the vessel, the magnetic field will make them travel in corkscrew, or helical, paths. This is the electron sheet, or E-layer.

The rotating electrons of the E-layer are expected to constitute a current, with the E-layer acting like a solenoid. The solenoid should create within itself a magnetic field of opposite direction that would modify the field initially present.

When the current in the layer reaches a high enough value, the net magnetic field in the central region creates a pattern of magnetic lines closing onto themselves inside the vacuum vessel. The closed magnetic lines thus form a "magnetic bottle" wherein plasma can be trapped.

At this time, a mixture of deuterium and tritium gas at room temperature would be admitted into the chamber. It would be immediately ionized by the electron layer and the resultant plasma, now trapped by the magnetic field, would begin to gain energy from successive collisions with the high-energy electrons in the E-layer.

In this way it should be possible to increase the temperature of the plasma to values of thermonuclear interest. The model now being built will be used to test the theoretical principles and is not expected to produce power.

Science News Letter, September 6, 1958

PUBLIC HEALTH

Fallout Will Continue

➤ THE END of nuclear weapons testing will not mean the end of fallout. Radioactive debris will continue silently to shower the earth for years to come.

Just how many years, however, is at present an uncertainty. A by-product of a nuclear test ban, ironically, could resolve the unknown about fallout. Currently, scientists are unsure of how much fallout is overhead, the rate it is falling to earth and how long it will take for the fallout depot in the stratosphere to dissipate. With no more debris being dumped skyward scientists will better be able to improve their estimates of these factors.

The fallout that will continue to rain on man, his land and oceans is known as stratospheric fallout and it is made up principally of the dangerous strontium-90. It has been estimated by scientists that one-half of the reservoir of the stratospheric fallout will come to earth within the next five to ten years. Some of it will never come down, but will decay and be dissipated in the stratosphere.

If testing comes to a halt, the strontium-90 locked "upstairs," as the scientists refer to the depot of radioactive debris hanging over the earth, is not enough to cause ground levels of strontium-90 to rise significantly when it falls to earth.

In the recent United Nations report on the Effects of Atomic Radiation, the UN Scientific Committee had this to say about continuing fallout:

"Analysis of fallout material has shown that strontium-90 can remain in the stratosphere for many years before being deposited on the earth. The depletion mechanism of the stratospheric reservoir is not yet adequately known. It has been estimated from measurement of fallout rate and stratospheric content that the annual strontium-90 fallout is about 12% of the stratospheric content. . . . The concept of a constant fractional removal per year of the stratospheric content is inconsistent with meteorological principle. However, nothing better can be offered at present."

Perhaps, as one scientist has suggested, the cessation of nuclear weapons testing will resolve many of these unknowns.

Science News Letter, September 6, 1958

MEDICINE

Linking Diseases to Blood Types Questioned

➤ A SWISS PHYSICIAN is questioning the validity of studies showing a relationship between blood types and susceptibility to certain diseases.

Stomach cancer, duodenal and gastric ulcer, diabetes mellitus, pernicious anemia, bronchopneumonia, toxemia of pregnancy and other diseases among blood types A, B and O have been studied both in Europe and the United States, Dr. Alexander Manuila of the Institute of Anthropology at the University of Geneva reports in the *Journal of the American Medical Association* (Aug. 23).

Most of these investigations have led to contradictory results and are open to objection on methodological grounds. For instance, one study indicated that stomach cancer was more common among group A than other blood types. Another comparable study indicated contradictory results.

Dr. Manuila suggests that statistical and technical pitfalls may be partially responsible for the inconsistency of the various results. A study of the original blood grouping of 2,050 men of the U. S. Armed Forces and Air Force revealed that typing was 8.8% in error. Another study revealed that as many as 10% of infants with blood group AB are sometimes wrongly classified as group B.

In addition, caution must be exercised to insure that samples for study are reasonably comparable in ethnic make-up. It is only the anthropologist who seems to be constantly aware of the differences that exist even within populations in a relatively small area.

Valid data can only be obtained if more regard is paid to sound methodology. This includes assurance that samples are reasonably comparable ethnically, awareness of the margin of error in this type of research, and complete rejection of the tendency to combine several small series into one large sample since there is no comparable control series for such a combination.

Science News Letter, September 6, 1958

CRYSTALLIZED HORMONE— ***These crystals of growth hormone were prepared from human pituitary glands. Quantities are being made available to extend exploratory clinical research in this field. Success in causing growth of pituitary dwarfs by human growth hormone has recently been reported.***

PSYCHOLOGY

Parents of Problem Child Found to Be Maladjusted

➤ THE PARENTS of problem children contribute a lot to making them problems.

This was reported to the American Psychological Association in Washington by Drs. Wesley C. Becker, Donald R. Peterson, Leo A. Hellmer, Donald J. Shoemaker and Herbert C. Quay, all of the University of Illinois. Their results indicate that the maladjustment of the father is more critical than that of the mother.

They based their conclusions on a study of father-mother-child groups at the University Psychological Clinic. They had come to the clinic because of a behavior problem with the child.

Both parents of the problem children were found to be maladjusted. The mother was found to be active, dictatorial, thwarting, and controlling by constant suggestion. The father did not tend to enforce regulations. In other words, the mother instigated aggressive behavior in the child while the father did little to curb its expression.

In addition, both parents gave vent to emotions easily—an example which the child tended to imitate.

A comparison of the personality of each parent with that of the problem child showed that the father was more important than the mother in determining the personality of the child.

The results suggested, commented the investigators, a revision of some of our ideas about who should be treated.

Science News Letter, September 6, 1958

BIOLOGY

Plant Extract Inhibits Hormone Secretions

➤ A STRANGE PLANT with a stone-hard seed is currently tantalizing scientists with its powerful effects on the endocrine glands.

Cold water extracts of dried preparation of the whole plant have a marked effect on the secretion of sex hormones, whether injected or given by tube feeding.

Injection of the plant extract greatly lowers the functional activity of the thyroid gland. It also reduces gland size.

It inhibits the growth of some kinds of tumors in mice and apparently can inactivate glucagon—a hormone influential in sugar metabolism. This finding may be significant in studies of diabetes.

Reporting on recent studies of the action of "lithosperm," Dr. W. R. Breneman of the department of zoology at Indiana University told the American Society of Zoologists meeting in Bloomington, Ind., that the plant extract influences hormone action both in the living animal and in test tube preparations.

So far, the endocrinologist pointed out, research with lithosperm is largely exploratory. Applications of the results may be a long way off. Scientists working with the extract still do not know what chemical or compound in the plant is causing the hormone inactivation. However, biological tests of the extract's effects are being made along with chemical analyses of the extract. Dr. Marvin Carmack of the Indiana University chemistry department heads this part of the program.

Injection of lithosperm into roosters for ten days prevented testis growth and androgen hormone secretion. Egg-laying in hens was stopped by injections and the hens regressed to pullet development with respect to sexual maturity.

Other tests showed that the plant extract inhibits the anterior pituitary luteinizing hormone, the hormone influencing formation of the corpus luteum in the ovaries.

Lithosperm, the extract from the plant *Lithospermum ruderale* that is found in scattered spots in Wyoming, Montana, Nevada, Colorado and Washington, was first brought to the attention of scientists in a study of the folklore medicine of some western Indian tribes. The Indians claimed the plant could prevent conception in humans.

Tests with mice and chickens have proved the Indians' claims have basis in scientific fact. Application to human biology or medicine still needs to be studied, however, Dr. Breneman warned.

Science News Letter, September 6, 1958

GENETICS

Bison and Cattle Crossed, Hardy Breed Produced

➤ BY HYBRIDIZING the buffalo, which once dominated the western plains of America, with domestic beef cattle, Canadian animal breeders have produced a new kind of animal that promises to be of some use on the upland open ranges of western and northwestern Canada.

H. F. Peters of the Canada Experimental Farm in Alberta told the International Genetics Congress in Montreal that 130 cattalo cows, of half to sixteenth bison breeding, have resulted from an effort since 1915 to combine some of the hardy qualities of the American bison with the meat qualities of domestic beef cattle.

Sterility of the bulls resulting from the cross has prevented the production of a true new breed. The cattalo cows do forage for themselves during the winter on the upland ranges more effectively than cows of domestic breeds. Cattalo calves put on significantly greater weight than bison but less than Herefords. Their meat production decreased as the proportion of bison breeding increased.

The improvement of farm livestock is a long process but Lavon J. Sumption of the University of Nebraska and William E. Rempel of the University of Minnesota told the Congress that significant progress within the working lifetime of an animal breeder is possible, although the annual rate of evolutionary change is often indiscernible. It took six generations to produce a new line of swine, called Minnesota No. 3.

A team from the U. S. Department of Agriculture, Beltsville, Md., H. O. Hetzer, J. H. Zeller and R. L. Hiner, told how in three generations two lines of Duroc swine were developed to give fat meat in one case and lean meat in another.

Science News Letter, September 6, 1958

IN SCIENC

BIOLOGY

Lobster Hearts Used For Drug-Action Study

➤ SPINY LOBSTER hearts may provide scientists with a new tool for studying the action of drugs.

The lobster heart, which contains nine nerve cells, appears to be a near-perfect model that permits the study not only of a single nerve cell in action, but its interaction with other heart nerve cells.

It is for this reason, explains Dr. Donald Maynard of the University of Michigan, that the spiny lobster heart might prove very useful to researchers for watching what happens when drugs, such as curare or barbiturates, reach a neuron. The effect of a drug on a lobster heart could illustrate a possible effect the same drug might have on human nerve cells.

Dr. Maynard, who is studying the growth of lobster heart nerve cells at the Bermuda Biological Station, has had no trouble getting all the hearts he wants. Although this bountiful clawless lobster is a delicacy on the Island, only its tail turns up on the dinner table.

At the same time that he is studying the heart's nerve cells, Dr. Maynard is also probing into the function of the lobster's pericardial organ. This organ is responsible for the release of a very powerful chemical stimulator for the lobster heart.

If Dr. Maynard can discover how this material is released, it could provide a clue to the release mechanism of certain hormones in humans. Science would then have another piece to fit into the jigsaw puzzle of how the human chemical factory works.

Science News Letter, September 6, 1958

PSYCHOLOGY

Lack of Oxygen At Birth Lowers IQ

➤ BABIES who suffer deficiency of oxygen at birth score lower on IQ tests taken later than do children whose birth was normal.

This effect of difficult birth on intelligence was reported to the American Psychological Association in Washington by Drs. Claire B. Ernhart, Frances K. Graham and Don L. Thurston of the Washington University School of Medicine and the University of Wisconsin School of Medicine.

More than 110 children, of whom 61 suffered lack of oxygen at birth, were given standard tests of intelligence and vocabulary when they were three years old. The tests were given without knowledge of the conditions of birth. The oxygen-deprived children scored "significantly lower" in both intelligence and vocabulary than those with normal births.

Science News Letter, September 6, 1958

NCE FIELDS

DEMOGRAPHY

Middle East Population Grows 4,000,000 Yearly

➤ THE POLITICAL and economic problems of the explosive Middle East are aggravated by an exploding population. The population of the Middle East is shooting up at the tremendous rate of 4,000,000 people a year, equivalent to the population of Chicago.

This striking figure was announced by the Population Reference Bureau in Washington.

In Egypt, some 23,400,000 people are pressed into the thin green ribbon of land along the Nile Valley. Here, surrounded by some of the world's most barren deserts, some 2,370 persons per square mile try to squeeze a living from the already overtaxed soil.

In Lebanon, Jordan, Syria and the sheikdoms of the Arabian peninsula accurate statistics are not available. But it is generally accepted that the region shows some of the highest concentrations of population in the world.

In Saudi Arabia, the population density has reached a high of more than 3,000 persons per square mile.

By contrast, the density in populous United States is only 239 per square mile.

The increase in population between 1956 and 1975 will be, it is estimated, 59% in Egypt, 61% in Turkey, 81% in both Iran and Iraq, 97% in Israel and 63% for the whole Middle East as compared with only 31% for the United States.

"The job of feeding and educating an additional 4,000,000 people each year, in a region already deeply engulfed in acute and chronic poverty, is staggering," Robert C. Cook, director of the Population Reference Bureau, said. "Peace and political stability seem unlikely under such unprecedented rates of population growth."

Science News Letter, September 6, 1958

MEDICINE

Plastic Eye Offers Advantages Over Glass

➤ CUSTOM-MADE plastic eyes that move in the eye cavity like normal eyes are now in use.

Movement of the artificial eye is accomplished by attaching the muscles of the eye to a surgically implanted sphere in the eye socket. Hence, when the sphere moves, it presses against the fitted eye, which has been placed in front of the sphere.

Developed by the Army Medical Service, the eye is made from a synthetic resin material similar to that used by dentists to construct dentures. It can be moved in the eye socket to correspond to the movements of the good eye.

In addition, there is no painful irritation caused from body acids that etch glass and no problem with extreme temperature changes, and the plastic eye can be polished if it gets scratched.

Perhaps the most important feature, to the wearer, is the satisfaction of knowing that the plastic eye looks like a normal eye, absorbing, rather than reflecting light as glass eyes do.

While the glass eye is made in standard sizes, the plastic eye is individually fitted to the eye socket of the patient, Sergeant Gene A. Stewart of the plastic eye section of the main eye clinic, Walter Reed Hospital in Washington, said.

The iris, or colored portion of the eye, is painted a color that most closely matches the good eye. Then the eye is baked, repainted to catch the exact hue of the good eye, and baked again. The entire process usually takes seven days.

Particular care must be taken when casting and molding the plastic eye, since the eye itself is not a perfect sphere. After the eye is fitted, more natural movement, and particularly, movement that corresponds to the movement of the good eye, is then possible. However, the cosmetic appearance of the artificial eye depends mainly upon the condition of the eye socket.

For those persons that have lost the visual use of an eye, but not the eye itself, a plastic "cosmetic shell," similar to a contact lens, is also available.

Science News Letter, September 6, 1958

BIOLOGY

Raw Fish Makes Mink Anemic

➤ RAW FISH, a fairly standard part of a mink's diet, may cause anemia in mink.

Young mink fed diets containing large amounts of raw coalfish and whiting were found to develop anemia, two Norwegian scientists report in *Nature* (June 6). Young mink or kits fed boiled fish, on the other hand, showed no signs of this blood deficiency.

Sick kits lost their appetite, did not grow well, their coats were dull and the underfur was white or grayish. Mortality was about 20% to 30%.

Apparently, the scientists say, there is some "heat-labile factor capable of producing anemia, probably an enzyme in the raw fish." Some species of fish, such as catfish and blue halibut, had no effect on the minks when fed to them uncooked.

A. Helgebostad and E. Martinsons of the Research Station for Furbearing Animals, Norwegian Veterinary College, Oslo, studied 350 mink. In addition to the presence or absence of raw or cooked fish, the diets of all the mink included vitamin supplements. Some of the animals also were fed raw meat. Only those animals fed raw coalfish and whiting developed anemia and light underfur.

Organic preparations of iron, especially when administered parenterally rather than orally, brought the anemic animals back to normal.

Studies are underway to identify this anemia-producing factor in some raw fish.

Science News Letter, September 6, 1958

MEDICINE

Lifesaving Insulin Can Kill When Misused

➤ ALTHOUGH INSULIN has life-sustaining properties that are essential to many diabetics, it can also snuff out a life as effectively as any known murder weapon.

This possibility was considered and executed by a male nurse who was accused and convicted of his wife's murder, six investigators report in the *British Medical Journal* (Aug. 23).

Ironically enough, it was the husband's inaccurate account of his attempt to save his wife's life that led to further examination of the body. Scrutinization of her skin tissue revealed injection marks, after which 84 units of insulin were recovered from the surrounding tissues. Before the injection marks were discovered, death had been attributed to accidental drowning in the bathtub.

Death from accidental overdoses of insulin are known to have occurred in diabetics, psychiatric and insulin-sensitive patients, the investigators explain. They are Dr. M. R. Gurd, V. J. Birkinshaw and S. S. Randall of Boots Pure Drug Company, Nottingham, and Dr. A. S. Curry, Forensic Science Laboratory, Harrogate, Yorkshire, D. E. Price, Beckett Hospital and Forensic Science Laboratory, and P. H. Wright, department of chemical pathology, Guy's Hospital Medical School, London.

They believe this to be the first occasion on which a murder-by-insulin charge has been substantiated although known cases of attempted suicide by insulin have been recorded.

An overdose of insulin triggers a drop in the blood sugar level, followed by vomiting, perspiration, gross dilation of the pupils, and finally unconsciousness.

Science News Letter, September 6, 1958

AGRICULTURE

Agriculture Department Forecasts Plant Diseases

➤ OUTBREAKS of mildews, blights and molds can now be forecast ahead of time, just as the weather.

A USDA forecasting service predicts the occurrence of many diseases affecting important food crops so that farmers can take steps to protect their crops. Advance notice of conditions favoring an epidemic of a specific disease may come several weeks or months ahead of time, Dr. Paul R. Miller told scientists attending the American Phytopathological Society meeting in Bloomington, Ind.

The relationship between weather and disease development has provided the basis for accurate prediction of disease outbreaks. Both laboratory tests and studies of past temperature-disease figures are used to help the forecasters.

Recent developments in instruments to measure and record weather conditions include automatic recorders of temperature, relative humidity and duration of the dew.

Science News Letter, September 6, 1958

PSYCHIATRY

Open Mental Hospital Doors

The new therapeutic technique of open doors, coupled with other methods of treatment, is changing the picture of the mental hospital program in the U. S.

By HELEN BUECHL

➤ A LITTLE more than two years ago a group of six men journeyed to England. The result of that journey was to affect the lives of many of the 700,000 mental hospital patients in the United States.

The journey, in effect, was the beginning of a revolutionary movement in the mental hospital program in this country.

The visitors to Great Britain, all directors of New York State mental hospitals, had found a new type of approach to the care of mental patients.

No more iron bars, fences, ward locks or constant vigilance.

Instead, they found opened doors, unbarred windows, and freedom for most patients. There was almost a complete lack of shouting, screaming, aggression and fighting. Yet these were the identical patients who had previously acted so wild that they "had to be restrained."

A striking feature of all the British mental hospitals visited was the physical appearance of the wards with their household-type furnishings. There were invariably rugs, drapes or curtains, upholstered furniture, bedspreads, vases of flowers, and colorful paint or wallpaper.

Aim Is Homelike Surroundings

The purpose of these changes was to put the patient in more normal homelike surroundings, making him more comfortable and, at the same time, building his self-respect. Another way of building the patient's self-respect was by improving his personal appearance and individuality of dress.

Most of the patients' clothing was purchased from local stores and nothing was accepted that was out of style or shoddy. On their tour, the visitors found that each patient unable to provide his own was given an allocation of clothing. He would go to the storehouse to choose his suit, overcoat, hat, shoes, underwear, socks, ties, shirts and night clothes from the assortment there.

Alterations were made when necessary. Every effort was made to cater to the individual taste and each garment was marked with the patient's name. Later, when clothes were sent to the laundry, they came back to the same patient; at no time was he required to wear clothing that might have been previously worn by another patient.

The English open-door policy seemed to encourage each patient to take proper care of his clothes. Each was provided with a full length locker and had custody of the key. The patient was not required to hang his clothing in a common clothing room or put it under his mattress at night as is the case in some of the mental hospitals in the United States.

In Nottingham, a city of 306,000, the visitors saw a mental hospital containing 1,000 beds, located centrally in the city. This hospital serves all the psychiatric needs of the area. It is truly an "open hospital"; the majority of the patients are admitted on voluntary application, while short-term treatment for the newly admitted is provided.

The Nottingham hospital provided a home-care plan for the senile which involved a daily visit by a nurse, a bi-weekly visit by a social worker, or a weekly visit by a district health officer. In addition, the patient visited the local general hospital clinic once weekly.

Returning to the United States, the visitors decided to apply the open-door policy to mental hospitals here.

One of the first mental hospitals to experiment with the open-door policy was the St. Lawrence State Hospital located at Ogdensburg, N. Y.

Here it was decided that, at the beginning, an open ward would be one where the doors were unlocked at least eight hours every day and from which patients could leave at will. They could go outdoors without being stopped or questioned.

As the program developed, many of the wards remained open between nine and twelve hours or more per day. The outside doors of the buildings were usually locked at night much the same as in a private home.

Previously, within the close confines of the locked door areas, even though the patients had become more quiet with tranquilizers and were responding much better, they were restless and needed something to do and something to take up their time. An increased program in recreational and occupational therapy did not seem sufficient. The tension between the ward personnel and the patients, and among the patients themselves, was still present.

One of the most remarkable results of the new program was to see a lessening and disappearance of this tension as the doors were opened.

The new policy increased the patient's opportunities for participation in occupational therapy, recreational activities, or work therapy in the hospital industries, such as the laundry, sewing room and farm area. No longer escorted to and fro by an attendant, the patient is now able to report for work, therapy or recreation by himself just as he would on the outside.

The problem of suicides, escapes and as-

A CAMPUS ATMOSPHERE—Patients at the Hudson River State Hospital, Poughkeepsie, N. Y., enjoy a croquet game on the hospital grounds, as part of the state's Department of Mental Hygiene's "open-door" policy.

saults have proved to be no different than they were before the open-door policy was begun. A few patients wandered off to their relatives at first, but they returned shortly.

Even the state troopers and the sheriff's department in surrounding communities took it as part of the day's work to return an occasional patient who wandered away or tried to get home and got lost. The law officers took it all very good-naturedly. They did not handcuff the patients, nor think of them as homicidal maniacs, and they were not thrown in jail. The patients were simply picked up much the same as lost children or amnesia victims, and returned to the hospital.

As each ward was opened at the St. Lawrence Hospital, there was always a period varying from two weeks to two months when patients just walked around the grounds or sat under trees or along the St. Lawrence River to watch the boats go by. Some stood along the road watching cars go by. It seemed that they were making an effort to catch up with the times, Dr. Herman B. Snow, director, pointed out.

Results Seen Immediately

It had been feared that the patients would not be able to take adequate care of their clothing. But when the clothing rooms were unlocked, it was found that the patients were not untidy. They took good care of their things and there was no problem of lost articles or people wearing each other's clothes.

The women began requesting mirrors and more beauty parlor appointments. The men began shaving more often and attended to their grooming needs with more deliberation.

New recreational facilities and outdoor activities were initiated. More dances were held. The entire atmosphere of the hospital changed.

New treatment methods, including the tranquilizing drugs, have restored many patients to quiet, relaxed behavior. Moreover, it was found that much of the tension had been due to the atmosphere created by the locked doors, grates on windows and the close confinement of large numbers of people in small areas.

Only a very small percentage of mental patients have ever really required those restrictions and with today's therapies this number is reduced to a minimum.

This new trend is changing virtually overnight the traditional methods of the treatment of the mentally ill, thanks in great part to Dr. Paul H. Hoch, New York State's Commissioner of Mental Hygiene, who adopted this new policy for all of the state's hospitals, and also to the six men who journeyed to Great Britain. They were Drs. Francis J. O'Neill, director of the Central Islip State Hospital; Nathan Beckenstein, director, Brooklyn State Hospital; Robert C. Hunt, director, Hudson River State Hospital; Hyman Pleasure, director, Middletown State Hospital; Herman B. Snow, director, St. Lawrence State Hospital; and Christopher F. Terrence, director, Rochester State Hospital.

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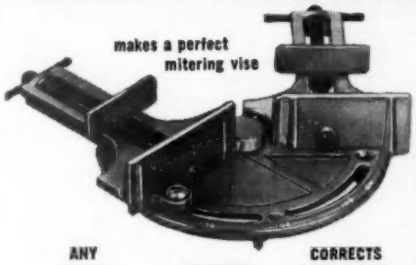

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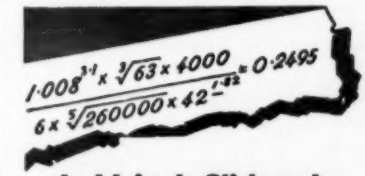

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THE ACADEMY OF SCIENCES OF THE USSR REPORTS OF THE FOURTH SOVIET CONFERENCE ON ELECTROCHEMISTRY—A. N. Frumkin and others in English translation—*Consultants Bureau*, 89 p., paper, $12. Discusses general questions on electrochemical kinetics and reaction mechanism of electrochemical reduction.

THE ADVANCE IN AIR SAFETY—Civil Aeronautics Board—*Govt. Printing Office*, 30 p., illus., paper, 15¢. Supplemental Report on air traffic and regulations.

ADVENTURES IN THE WORLD OF SCIENCE—Charles Greeley Abbot—*Public Affairs Press*, 150 p., illus., $3.50. The Secretary of the Smithsonian Institution, 1929-1944, recollects 60 years of his life spent among eminent men of science and government.

A CHECKLIST OF THE FRESHWATER FISHES OF CANADA AND ALASKA—W. B. Scott—*Royal Ontario Museum, Div. of Zool.*, 30 p., paper, 35¢. First up-to-date listing since 1913.

THE ETERNAL SEARCH: The Story of Man and His Drugs—Richard R. Mathison—*Putnam*, 381 p., illus., $5.95. A reporter's anecdotal history of drugs and medicines through the centuries.

GUIDE TO MARS—Patrick Moore—*Macmillan*, 124 p., illus., $2.75. Summarizes the present state of our knowledge of the "red" planet for the general reader and amateur astronomer.

HAMMOND'S NATURE ATLAS OF AMERICA—E. L. Jordan and others—*Hammond*, 256 p., 320 paintings by Walter Ferguson and John Cody, 104 maps, $7.50. For nature lovers who are not scientists; includes complete list of national public outdoor facilities for the study of nature.

HANDBOOK ON HERBS—Helen Tilton Batchelder and others—*Brooklyn Botanic Garden*, 172 p., illus., paper, $1. Illustrated dictionary of herbs, with articles on specific aspects of herb gardening.

HISTORY OF THE BRITISH IRON AND STEEL INDUSTRY: From c. 450 B.C. to A.D. 1775—H. R. Schubert—*Routledge & Kegan Paul (Macmillan)*, 445 p., illus., $12. First comprehensive history of British iron and steel from its earliest period to the time of the introduction of steam power.

METALS AND ENZYME ACTIVITY—Biochemical Society Symposium No. 15—E. M. Crook, Ed.—*Cambridge Univ. Press*, 102 p., illus., $3.75. Of interest to research workers, including inorganic and organic chemists, biochemists and those in the medical sciences.

MICROBIOLOGY—Michael J. Pelczar, Jr. and Roger D. Reid—*McGraw-Hill*, 564 p., illus., $8. Textbook introducing the student to the fascinating world of microorganisms—what they are, what they look like, what they do, and how they can be controlled and exploited to the advantage of mankind.

NAUTILUS: A Game of Sea Shell Aristocrats—A. Gordon Melvin—*Nature Games*, illus. by Jean Colton, 56 cards, $1.35. Arranged in scientific order, cards give Latin name, authority, location, common name and size of sea shells. Rules for several games are given.

THE PHILOSOPHY OF PHYSICAL SCIENCE—Sir Arthur Eddington—*Univ. of Mich. Press.*, new ed., 230 p., paper, $1.75. Based on a course of lectures given in 1938.

PHYSICAL RESEARCH PROGRAM: U. S. Congress Hearings—Subcommittee on Research and Development of the Joint Committee on Atomic Energy—*Govt. Printing Office*, 785 p., illus., paper, $2.25. On the physical research program as it relates to the field of atomic energy.

PROJECT SHERWOOD: The U. S. Program in Controlled Fusion—Amasa S. Bishop—*Addison-Wesley* for U. S. Atomic Energy Commission, 216 p., illus., paper, $5.75. First account of the heretofore top-secret U. S. search for the means of controlling thermonuclear reactions. Part of U. S. presentation at Second Atoms-for-Peace Conference in Geneva.

PROPOSED EURATOM AGREEMENTS: Hearings, Parts I and II—U. S. Congress, Joint Committee on Atomic Energy—*Govt. Printing Office*, 515 p., illus., paper, $1.30. On proposed legislation to carry out the cooperative program between the U. S. and the six member nations of the EURATOM group in the development of peaceful atomic power.

PUBLIC EXPOSURE TO IONIZING RADIATIONS: What Public Health Personnel Need to Know—Marcus Rosenblum—*Am. Public Health Assn*, 55 p., illus., paper, $1.35. Prepared by the Program Area Committee on Radiological Health of the Technical Development Board of the American Public Health Association.

REPORT OF THE UNITED NATIONS SCIENTIFIC COMMITTEE ON THE EFFECTS OF ATOMIC RADIATION—United Nations General Assembly—*Int. Documents Service*, 228 p., map, paper, $2.50. See p. 151.

SCIENTIFIC INFORMATION REPORT: Vol. I, No. 1—Central Intelligence Agency, English translations—*Office of Technical Services*, 199 p., paper, $2.75, issued semi-monthly, $28 per year. Presents unevaluated information extracted from publications of the USSR, Eastern Europe and China. Intended to indicate current scientific developments and activities in these regions.

THE SCIENTIFIC INSTRUMENT INDUSTRY—James R. Irving—*Bellman Pub. Co.*, Vocational & Professional Monograph No. 98, 60 p., illus., $1. Thorough description of the industry and the qualifications for entering it. Contains list of scientific instrument makers.

SEMIMICRO EXPERIMENTAL ORGANIC CHEMISTRY: A Laboratory Manual—Nicholas D. Cheronis—*de Graff*, 400 p., illus., $5.50. Completely rewritten text based on 1943 work "Semimicro and Macro Organic Chemistry" by the same author.

SINGLE SIDEBAND FOR THE AMATEUR—*American Radio Relay League*, 2nd ed., 210 p., illus., paper, $1.50. A digest of articles on single sideband transmission and reception.

SOVIET ABSTRACTS: Chemistry—U. S. Joint Publications Research Service, English translation, *Office of Technical Services*, paper, $2.50. Report consists of entries in the Soviet Chemistry Abstracts journal No. 9, 1957, originally published in the Sino-Soviet bloc and Yugoslavia.

TENTATIVE RECOMMENDED FIRE PROTECTION PRACTICE FOR NUCLEAR REACTORS—NFPA Committee on Atomic Energy— Winthrop M. Jones, Chairman—*Nat. Fire Protection Assn*, 64 p., illus., paper, $1. Discusses hazard problems of the various types of reactors.

TIKAL REPORTS: Numbers 1-4—Edwin M. Shook, William R. Coe, Vivian L. Broman and Linton Satterthwaite—*University Museum*, 150 p., illus., paper, $2.50. First of a series of technical papers on the archaeological project at the famous Maya site of Tikal, Guatemala.

U. S. AVIATION TODAY: 1958—*Nat. Aviation Educ. Council*, 123 p., illus., paper, 75¢. Pictures and descriptions of U. S. aircraft.

VISTAS IN ASTRONAUTICS—Morton Alperin, Marvin Stern and Harold Wooster, Eds.—*Pergamon*, 330 p., illus., $15. First Annual Air Force Office of Scientific Research Astronautics Symposium, co-sponsored by Convair Division, General Dynamics Corporation.

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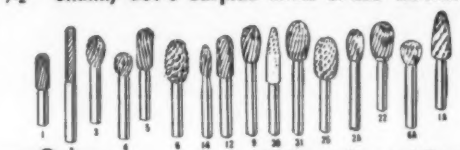

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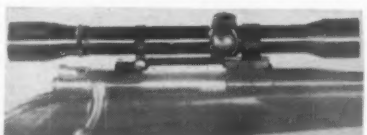

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2. HIGH GAIN FERRITE LOOPSTICK ANTENNA

3. BUILT-IN PERSONAL SPEAKER PHONE

These are the same features you will find on portable Transistor Radios selling for $40.00 - $50.00 and $75.00. Because at $7.95, we have sale priced this radio so far below its regular list price, we have agreed not to mention the manufacturer's name in our advertising. NOW . . . to make sure that your transistor portable doesn't merely "just play," but gives you the finest reception possible . . . electronic engineers have added 3 bonus features . . . features you would ordinarily expect to find only on expensive portable sets! First, there is the super-distance built-in Ferrite Loop antenna, plus auxiliary external antennae attachment which gives your transistor radio out of town reception. Second, for extra clarity and ample volume, a transistor amplifier has been incorporated into the circuit. Third, a personal earphone speaker which enables you to listen to your favorite program in complete privacy, even in bed, without disturbing others. This feature alone will give you more hours of use and pleasure than you have ever enjoyed from a radio before. Remember . . . this personal speaker-phone is yours without a single penny's extra cost. In other words, when you receive your transistor portable radio, you are not getting a toy crystal set which has been widely advertised as a so called "Lifetime Radio," not a flimsy gadget, but a true precision engineered portable transistor radio which has been designed and guaranteed to give years of trouble-free service. This all-transistor model radio will operate on one small standard 15¢ flashlight battery for over **2000 hours without battery charge.** It actually costs less to operate than a comparable radio using house current. We guarantee your transistor radio will play with brand new clarity and power years from now because there are no radio tubes to wear out or replace. Never before has there been a guarantee as strong as this!

THINK OF IT!

Not only the smallest transistor portable in the world, but the lowest PRICED ONE TOO! THE PRICE . . ONLY $7.95. One of the most incredible inventions of our century . . . One that will leave your friends and neighbors completely startled the moment they see it . . . the moment they hear it! For the first time ever, a POCKET SIZED TRANSISTOR PORTABLE, FOR ONLY $7.95. The secret is a built-in lifetime power plant, the same type now being used by the Army and Navy in their radar and sonar equipment.

LOUD CLEAR RECEPTION IN FRINGE AREAS

Here for the first time ever is a transistor pocket size radio—that pulls in programs loud, sharp and clear. A miracle of electronic science that gives you excellent audibility in fringe areas. Yes, a completely new kind of radio . . . You simply turn it on, it starts to play INSTANTLY! It's like carrying your favorite entertainment with you on picnics, boat rides, on the beach, at camp. ANYWHERE! It will pull in broadcasts from miles away clear and sharp. Yet, with all of this super-power reception, here for the first time ever is a pocket-size portable that is as small and compact as a pack of cigarettes and just as light.

TRY IT FOR 10 DAYS!

Naturally, the best proof of just how sensational this PARADE TRANSISTOR RADIO really is, is in your own home. That's why we invite you to try it for 10 days . . . And, if after hearing its tone and clarity . . . if after using the personal earphone . . . if after taking it and using it wherever you go, you don't agree this is truly a once-in-a-lifetime opportunity to own this PARADE TRANSISTOR PORTABLE that's unlike any portable ever made and sold in this country before, then simply return it and it has not cost you a cent.

UNCONDITIONAL MONEY BACK GUARANTEE

10 DAY FREE TRIAL

FACTS!

- **Smaller and lighter than portable radios now selling for $50 to $75.**
- **Measures only 3¾" x 2⅛" x 1". Smaller than a pack of cigarettes.**
- **Weighs only 4 oz. complete with battery.**
- **Comes complete with battery. One flashlight battery costs 15¢, gives 2000 hours of radio reception.**
- **No electric plug-in. Safe for all.**
- **Picks up Conelrad. Civil Defense Stations**
- **Fits in the palm of your hand.**
- **Utilizes rugged stamped aluminum chassis.**
- **Large selection of stations.**
- **Manufacturers' unconditional written guarantee.**
- **Built-in transistor amplification circuit for added volume.**
- **Built-in hi-gain ferrite loopstick antenna.**
- **Personal Speaker Phone for private listening.**
- **Electronic circuit incorporates variable condenser for sharpest tuning.**
- **Simulated cowhide saddle stitched carrying case, FREE.**
- **Gold calibrated dial for easy tuning.**
- **Lowest cost transistor radio ever sold.**
- **THIS IS NOT A CHEAP IMPORTED CRYSTAL SET.**
- **Made in U.S.A. Precision engineered.**
- **No radio tubes to wear out.**
- **Costs less to operate than plug-in electric sets.**
- **Ruggedly constructed to give years of service**
- **Germanium Diode manufactured by G.B.S. Hytron.**
- **Transistor—Top Quality—Manufactured by General Transistor Corp.**

MAIL COUPON TODAY

GENERAL TRADING CO.
31 Second Ave. Dept. HP-2754
New York 3, N. Y.

Send me my PARADE TRANSISTOR RADIO (complete with personal earphones and batteries and built-in super distance antenna) right away with this understanding: If I don't agree that this is by far the greatest value offered in a portable radio . . . then you will refund my money immediately.

CHECK OFFER DESIRED **SAVE MORE**

☐ **I enclose $7.95 on money back guarantee. Postage Prepaid**

☐ **I enclose $14.95 (One for myself and one for a friend) and I save $1.00.**

☐ **Check** ☐ **Cash** ☐ **Money Order**

Name .....

Address .....

City ..... **State** .....

( ) Send C.O.D. I enclose $1.00 deposit and will pay postman balance plus postal charges.

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 951. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

AUTOMATIC THREADING 8 MM MOVIE PROJECTOR "whisks" the film through the threading mechanism in less than three seconds. This automatic threading mechanism forms the film loops, engages the sprocket teeth and directs the film through the proper channel. It can also restore a lost film loop without stopping the projector.

Science News Letter, September 6, 1958

FOOD STRAINER AND DRAINER made of aluminum is designed to prevent burns and save food. It locks onto the edge of a pot or bowl and can be adjusted to fit many sizes of pots and pans.

Science News Letter, September 6, 1958

SOLAR COOK STOVE is said to be able to cook four large hamburgers in less than ten minutes on a clear day. The cooker has aluminized plastic dual reflectors and aluminum and steel structural supports and pan. The total weight is less than four pounds.

Science News Letter, September 6, 1958

FOUNTAIN BRUSH designed to make dishwashing easier combines a rounded and tufted nylon brush with a polyethylene plastic bottle. The screw-on head is pierced so that water and detergent can be squeezed over the brush. The kitchen aid, shown in the photograph, keeps hands out of water, dries quickly and is odor-free.

Science News Letter, September 6, 1958

"SKID-CHAINS" for shoes provide traction on icy surfaces. The skid-chain is in the form of a triangle with one-half-inch rubber bands fastened through metal loops at each end. One rubber band is slipped over the toe of a shoe and the other over the heel. The chain is brought along the sole of the shoe.

Science News Letter, September 6, 1958

UNDERWATER VIEWER for children is a ten-inch inflated pillow made of a vinyl plastic sheeting. By pressing the pillow against the surface of the water a child can look through clear plastic windows at the undersea world below. The pillow can double as a beach ball and floating toy.

Science News Letter, September 6, 1958

ALUMINUM SIDING that is described as self-insulating has a blanket of fiber glass laminated to the back of the aluminum clapboard. The fiber glass blanket is backed with a coated aluminum reflective insulation sheet. It is available in seven colors.

Science News Letter, September 6, 1958

DE-ICING AND DE-MISTING DEVICE for automobile and ship windshields is a British development. It consists of the insertion into panels of glass of a transparent film of gold and metal oxide. Glass panels as large as 30 by 42 inches can be treated. The laminated anti-ice device is said to operate on voltages ranging from 24 to 240.

Science News Letter, September 6, 1958

Nature Ramblings

By HORACE LOFTIN

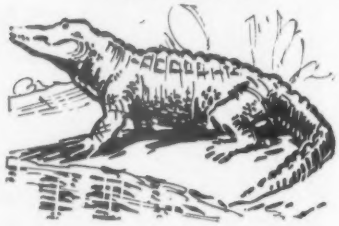
▶ ALL LIVING things are creatures of their surroundings. Form, habits and every particular of their lives are molded through eons of adapting to their environments.

When the familiar environment suddenly changes, due to natural or man-made causes, a plant or animal must move swiftly to conform to the new conditions. If the living organism does not it faces a losing fight in the struggle for survival.

One way of facing changing times and conditions is to diminish in numbers, alter in habits and "play a lesser role," while trying to hold on. The alligators of the southeastern United States present a good example of this, comparing their abundance and habits today with just two centuries ago.

In 1774, the Quaker naturalist William Bartram was voyaging alone on a seldom traveled part of the St. Johns River, Florida. He had pitched camp on the bank and set out in his boat to catch a string of fish for supper. He writes:

A Lesser Role



"I furnished myself with a club for my defense, went on board, and penetrating the first line of those (alligators) which surrounded my harbour, they gave way . . . but ere I had half-way reached the place, I was attacked on all sides, several endeavouring to upset the canoe.

"My situation now became precarious to the last degree: two very large ones attacked me closely, at the same instant, rushing up with their heads and part of their bodies above the water, roaring terribly and belching floods of water over me . . .

"I applied my weapons some effectually about me, though at random, that I was so successful as to beat them off a little; when, finding that they desired to renew the battle, I made for shore, as the only means left for my preservation . . ."

Such were the alligators of the 18th century. But since that time, Bartram's club and flintlock have been replaced with shotguns and automatic rifles. Cities have been built on what was once the alligators' domain. Drainage ditches have taken their feeding grounds.

The old belligerent ways of the alligators were not enough for the new environment that has come along with men. The aggressive bull 'gator who did not fear to attack a boat has yielded to the stealthy, secretive one, the only kind fitted for survival in a land filled with humans.

To see alligators today, you have to hunt for them. They have long given up hunting humans! This is a lesser role, but it has allowed the creatures to survive in a changing world.

Science News Letter, September 6, 1958